# *e-business: Designing Integrated Solutions*

(Course Code P3206)

## Student Exercises

ERC 4.0

IBM Certified Course Material

## Trademarks

IBM® is a registered trademark of International Business Machines Corporation.

The following are trademarks of International Business Machines Corporation in the United States, or other countries, or both:

AIX
DB2
IBM
iSeries
OS/2
Redbooks
Tivoli
VSE/ESA
AS/400
DB2 OLAP Server
IMS
MQSeries
OS/400
SecureWay
TXSeries
WebSphere
CICS
Everyplace
Intelligent Miner
MVS
QMF
SupportPac
VM/ESA
zSeries

Approach, Domino Designer, Domino, iNotes, Lotus Notes, Lotus Workflow, Lotus, Notes and Sametime are trademarks or registered trademarks of Lotus Development Corporation and/or IBM Corporation in the United States, other countries, or both.

Intel is a trademarks of Intel Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States and other countries.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product and service names may be trademarks or service marks of others.

**April 2003 Edition**

The information contained in this document has not been submitted to any formal IBM test and is distributed on an “as is” basis without any warranty either express or implied. The use of this information or the implementation of any of these techniques is a customer responsibility and depends on the customer’s ability to evaluate and integrate them into the customer’s operational environment. While each item may have been reviewed by IBM for accuracy in a specific situation, there is no guarantee that the same or similar results will result elsewhere. Customers attempting to adapt these techniques to their own environments do so at their own risk.

**© Copyright International Business Machines Corporation 1999, 2003. All rights reserved.**
**This document may not be reproduced in whole or in part without the prior written permission of IBM.**
Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

# Contents

**Trademarks. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . v**

**Exercises Description . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . vii**

**Exercise 1. Introduction to Design . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1-1**

**Exercise 2. Building a Design using Assigned Self Service Patterns . . . . . . . . . . . 2-1**
Case Study: Account Self Service at Friendly Foods . . . . . . . . . . . . . . . . . . . . . . . . .2-3

**Exercise 3. Selecting a Pattern Given Specific Business and IT Drivers . . . . . . . . 3-1**
Case Study: First Inter-Planetary Bank . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .3-4

**Exercise 4. Building a Design using Collaborative and Information Aggregation Patterns . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4-1**
Case Study: ABC Insurance . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4-3

**Exercise 5. Creating a Design for Application Integration . . . . . . . . . . . . . . . . . . . . 5-1**
Case Study: Supplier Integration at Friendly Foods . . . . . . . . . . . . . . . . . . . . . . . . . .5-3

**Exercise 6. Creating a Design for Security and Performance . . . . . . . . . . . . . . . . . 6-1**
Case Study: First Inter-Planetary Bank . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .6-4

# Trademarks

The reader should recognize that the following terms, which appear in the content of this training document, are official trademarks of IBM or other companies:

IBM® is a registered trademark of International Business Machines Corporation.

The following are trademarks of International Business Machines Corporation in the United States, or other countries, or both:

AIX®
AS/400®
CICS®
DB2®
DB2 OLAP Server™
Everyplace™
IBM®
IMS™
Intelligent Miner™
iSeries™
MQSeries®
MVS™
OS/2®
OS/400®
QMF™
Redbooks™
SecureWay®
SupportPac™
Tivoli®
TXSeries®
VM/ESA®
VSE/ESA™
WebSphere®
zSeries™

Approach, Domino Designer, Domino, iNotes, Lotus Notes, Lotus Workflow, Lotus, Notes and Sametime are trademarks or registered trademarks of Lotus Development Corporation and/or IBM Corporation in the United States, other countries, or both.

Intel is a trademarks of Intel Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States and other countries.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product and service names may be trademarks or service marks of others.

# Exercises Description

The exercises provide experience with designing e-business applications. The notation used in the book *Patterns for e-business: A Strategy for Reuse* and that in unit 3 will be used to document the designs (except in the first exercise which is intended to emphasize the need for a standard methodology and notation).

The exercises are intended to provide experience of applying the patterns for e-business and knowledge of e-business software applications to design. The features and functions of different software applications are not taught in this course, and students should have a good understanding of the products in the WebSphere product family and similar products. This knowledge can be obtained by attending the e-business: Technology Workshop.

# Exercise 1. Introduction to Design

## What This Exercise is About

In this exercise you will work as a team to communicate the design of a simple business scenario.

## What You Should Be Able to Do

At the end of the lab, you should be able to understand the need for standard design notations and methodologies.

## Introduction

You need to communicate the design of a single location bank (just the retail activities) to other developers (architects, designers, programmers, and so forth):

- Your design must be communicated in two flip charts, which should be self explanatory.
- You can use whatever you want to communicate the design.
- Your design will be reviewed as is.
- You will NOT present your design.
- After you post your design, walk around the other teams' design and answer additional reflection questions.

This exercise is to practice the process, position your skills within the team, and allow you to begin to identify who does what and what is to be done.

# Exercise 2. Building a Design using Assigned Self Service Patterns

## What This Exercise is About

Working in teams, students will draw a set of design diagrams to show a solution to the problems stated in the case study scenario for Friendly Foods (below).

## What You Should Be Able to Do

At the end of the lab, you should be able to apply the patterns for e-business to a business scenario.

## Introduction

In this exercise you will read a business case scenario and identify where the business and application pattern assigned to your team occurs in the business scenario.

Then you will create a set of design diagrams to describe a solution to the scenario. You must use the notation and templates as used in the *Patterns for e-business* book to document your solution.

After creating your design, your team will present the design to the rest of the class and discuss the factors that influenced design decisions.

Finally the class will evaluate the designs against the business and IT drivers identified in the case study.

## References and Resources

Book: *Patterns for e-business: A Strategy for Reuse*

Redbook: *Self-Service Applications using IBM WebSphere V4.0 and IBM MQSeries Integrator*, SG24-6160

Redbook: *User-to-Business Patterns Using WebSphere Enterprise Edition*, SG24-6151

Web Site: IBM Patterns for e-business
http://www-106.ibm.com/developerworks/patterns/
Offline version also available on CD.

# Exercise Instructions

## Deliverables:

Diagrams showing the system and components for the specified pattern.

1. Solution Overview diagram - This chart shows the general view of the various components, products and technologies organized in a clear and readable fashion. This diagram is expected to be an example of a run-time diagram. Examples can be found in the redbooks and in the book referenced above.
   - See unit 3
   - See pages 21- 23 of the bBook.
   - See page 38, Fig.5 in SG24-6151 or pages 23-24 of SG24-6160.
2. Static application component diagram - This chart shows the software components for the application solution, located in their tiers and servers.
3. Dynamic flow diagram - This chart shows the specific software pieces needed to explain the flow of data and control through the system for one use case.
4. Business drivers - evaluation chart 1 - fitness for scenario - This chart shows a list of the Business drivers from the Book for the teams' assigned pattern. Each driver is given a rating by the team from 1 to 5, where 5 is low. This rating is a measure of how well the pattern fits the needs of Friendly Foods.
5. IT drivers - evaluation chart 2 - fitness for scenario - This chart shows a list of the IT drivers from the Book for the teams assigned pattern. Each driver is given a rating by the team from 1 to 5, where 5 is low. This rating is a measure of how well the pattern fits the needs of Friendly Foods.

**Notes:** Diagrams may be prepared and presented multiple ways: for example, transparencies and pens are available. A large screen projector will allow the presentation of PowerPoint/Freelance/Visio from a student's laptop (no software is loaded on the classroom machines to help this); flip charts and stands/pens are provided. In any media, clarity, readability, and neatness are paramount. Watch the fonts!

## Agenda and Timeline:

This exercise has the following time line:

| | |
|---|---|
| Reading and Design | 90 minutes |
| Team Presentation of Design | 15 min/team |
| Team evaluation of pattern (charts 4,5) | 15 min/team |

Reading and Design: In the 90 minutes, teams must read and discover the drivers from the case study, apply the assigned pattern and create the ratings lists. Since it will take about 25 minutes to physically draw the diagrams, control of the time is critical. Follow the PDR scheme.

### Pattern assignments: (all from Self Service Business Pattern)

- Team 1: Directly Integrated Single Channel application pattern
- Team 2: Router Application pattern
- Team 3: Agent application pattern
- Team 4: (if present) Decomp application pattern.

## Case Study: Account Self Service at Friendly Foods

The customer in this case is a bakery manufacturer, Friendly Foods. It manufactures various lines of bakery products. Its primary set of customers is retail stores, who have their shelves stocked by Friendly Foods delivery service on a periodic basis. As Friendly Foods has grown, the number of retail stores and the breadth of it product lines have also grown. Demands on customer service have increased dramatically, causing Friendly Foods to evaluate alternate channels for providing customer service.

**Business drivers:**

- **Improve customer service** - This is high priority with several desired functions:
    - Allow the customer to check account status at any time, eliminating the possibility of being put on hold.
    - Existing orders allowed to be changed on a routine basis.
    - It is important not to lose the personal touch when substituting live interaction with electronic interaction. The customer should have a personalized experience whenever dealing with Friendly Foods.
    - The customer should find that customer service at Friendly Foods is always available.
    - Customer service must be responsive, with minimal wait times during interactions.
    - Requirements placed on the customer are to be minimized to promote usage.
- **Hold down cost** - This is high priority.
  Friendly Foods is not willing to spend a whole lot of money, since the alternatives include adding relatively low-cost customer service reps.
- **Reduce time and effort to deploy new enterprise applications** - medium priority
    - This is a medium priority to the executives but a real hot button for the CIO and IT staff. Friendly Foods does not have an extensive IT staff. The solution should only require products which are relatively easy to learn and use.
- **Prudent IT Investments** - medium priority
    - Provide an enterprise architecture and infrastructure that can be used for other applications so that skills can be leveraged.
    - Ensure a level of manageability for new systems that is equal to existing systems.

  - Avoid locking in hardware and/or operating system platforms.
- **Protect customer information** - High

To address some of the business drivers above, the customer has already defined the following for an account self service application:

- Since most stores have Internet accounts, the Web will be used as the network between Friendly Foods and the stores.
- Any Web browser can be used, although requiring minimal browser version levels is acceptable. High
- Users can check their account status, including their recent purchases and when payments are due.
- Orders can be changed, created, and deleted.
- The customer will be identified for personalization purposes through the use of a login procedure.
- Application will access DB2 data directly.

**Example Application Flow**

- User points browser to customer self service page
- User logs in, and gets a personalized page
- User checks account status
- User looks at recent order and changes order mix

**Non functional requirements:**

- Operational requirement: 24x7 - medium
- Performance requirement: Response time is five seconds for page to page - High
- Scalability: Number of online users > 5000, Number of concurrent Online users 100, Potential of going to 200,000 customers in two years - High
- Availability: 95% of the time - High
- Extendibility: Potential for adding new functions, including account report generation and personalized promotional - Medium

After the initial contact and information collection phase, Friendly gave additional requirements to the design team.

Fred Friendly's new son in law, Albert, has become a vice president of Friendly Foods and has shown Fred a business opportunity using the existing drivers and trucks now stocking the shelves at customers' stores. The items to be sold are a line of consumer decoration and craft items, some of which can be used in baking and food preparation. Albert wants to sell these items through the stores, delivering and stocking using the existing drivers and to support the ordering and buying of items on line. Albert has bought a small company (compared to Friendly) which has the product line and IT system to support ordering through CSRs (customer support representatives) using a catalog. This company, "Decorator's Delight", or DD as it is known in Friendly Foods, will be managed as a separate business, at least as far as keeping the product lines, names and catalog in existence. Albert says this will preserve the existing revenue, while allowing FF to leverage additional revenue from the product line and minimizing costs to grow. The FF staff intend to allow existing customers to order these additional items online, but will also keep the DD CSR staff and catalog open. Lately, some larger customers have also talked to Fred about keeping some of FF's CSRs around to insure they have another channel.

# Exercise 3. Selecting a Pattern Given Specific Business and IT Drivers

## What This Exercise is About

Working in teams, students will draw a set of design diagrams and create lists to show a solution to the problems stated in the case study scenario for FIPB (below).

## What You Should Be Able to Do

At the end of the lab, you should be able to apply the patterns for e-business to a business scenario.

## Introduction

In this exercise you will read a business case scenario and select one of the application patterns from the Access Integration Business patterns that presents a solution to the business scenario.

Then you will create a Runtime Pattern diagram for your design and document your criteria for selecting the pattern and not other patterns. You must use the notation and templates as used in the *Patterns for e-business* book to document your solution.

After creating your design, your team will present the design to the rest of the class and discuss the factors that influenced design decisions.

## References and Resources

Book: *Patterns for e-business: A Strategy for Reuse.*

Redbook: *Access Integration Pattern Using IBM WebSphere Portal Server,* SG24-6267

Web Site: IBM Patterns for e-business
http://www-106.ibm.com/developerworks/patterns/
Offline version also available on CD.

# Exercise Instructions

## Assignment:

Choose one of the application patterns from the Access Integration Business patterns that presents a solution for the First InterPlanetary Bank. Diagram the solution as a run-time pattern, and document the criteria that led to your choice and the criteria that led you to not choose other patterns. Prepare to present the deliverables (solution overview and two lists) in a 15 minute period.

## Deliverables:

Diagrams showing the system and components for the chosen pattern.

1. Solution Overview diagram - This chart shows the general view of the various components, products and technologies organized in a clear and readable fashion. This diagram is expected to be an example of a run-time diagram. Examples can be found in the redbooks and in the book referenced above.
    - See pages 21- 23 of the book.
    - See Chapter 5, any of several figures in SG24-6267.
2. List of drivers and factors for FIPB leading to your choice of pattern.
3. List of criteria that led you not to choose one of the other 3 patterns in the Access Integration group. This is a separate chart from the one showing your positive criteria.
4. Table with your team's rating of the patterns as fit for FIPB's business needs. Rate the patterns in the Extended Enterprise and Access Integration categories using the table in the figure below and the criteria descriptions described. This table will be filled and discussed during the evaluation phase of the exercise, but keep it in your mind as you go through pattern choice and diagramming.

**Notes:** Diagrams may be prepared and presented multiple ways: for example, transparencies and pens are available. A large screen projector will allow the presentation of PowerPoint/Freelance/Visio from a students laptop (no software is loaded on the classroom machines to help this); flip charts and stands/pens are provided. In any media, clarity, readability, and neatness are paramount. Watch the fonts!

## Agenda and Timeline:

This exercise has the following time line:

| | |
|---|---|
| Reading and Design | 180 minutes |
| Team Presentation of Design | 15 min/team |

Reading and Design: In the 180 minutes, teams must read and discover the drivers from the case study, chose a pattern from the assigned pattern category, draw the runtime diagram, and create the ratings lists and table. Since it will take about 40 minutes to physically draw the diagrams and create the lists, control of the time is critical. Follow the PDR scheme.

## Pattern choices: (all from Access Integration Business Pattern or from Extended Enterprise Business Pattern)

- Access Integration:
    - Pervasive Devise Access
    - Single signon and role-based access
    - Personalized delivery (see web site)
- Extended Enterprise:
    - Document Exchange
    - Exposed Application
    - Exposed Business Services
    - Managed Public Processes
    - Managed Public and Private Processes

## Evaluations:

After the presentations and discussion, teams will complete the table with numeric ratings for each pattern in the Access Integration and Extended Enterprise Business Patterns. The ratings will relate the pattern's fitness for solving the FIPB case in the criteria area shown. Ratings will be from -3 to +3. For example; if you believe the Pervasive Device Access pattern is almost perfect for the usability criteria, you would rate it a "+3".

Table and criteria:

| Pattern | Perf/ Capacity | Maint/Mgt | Usability | Security | Scalability | Business Quality |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

- Performance/Capacity: the response time for requests, and total number of requests that can be handled
- Maintainability/Manageability: the ability to modify the system, delete unwanted capabilities, adapt to new operating environments, and restructure the system
- Usability: ensuring that the right information is available to the user at the right time and ensuring that the user requests gets to the right service providers.
- Security: the ability to resist unauthorized access and allow legitimate users access

- Extendibility/Scalability: the ability to make incremental changes quickly and cost effectively, and the ability to handle ever increasing loads.
- Business Quality (cost, schedule, staff, resources, ...)

## Case Study: First Inter-Planetary Bank

The First Inter-Planetary Bank (FIPB) provides Banking and Financial Services for its customers. Their services include Terrestrial Checking, and Savings Accounts and Inter-Planetary Bank transfers. Currently their checking account information is stored on an IBM 390 Mainframe and their savings account information is stored on an AS400 system. These legacy systems are in different locations. Access to these systems is currently done by tellers with dedicated terminals or by call center representatives (CSRs) using terminals with Green Screen client applications. Customers can also make deposits, withdrawals, check balances and get account summary reports using ATM machines.

FIPB finds that its customers are increasingly demanding and expecting on-line banking services. FIPB is facing intense competition from its bigger rivals such as Universal Banking, which offers a full range of online banking services. The business managers at FIPB decided that they had to act quickly to keep from losing their share of the Inter-Planetary banking market. They needed to offer their customers an on-line service that would perform the following tasks online:

1. Request a pin across the Web. The pin request would be captured in a Database that would be reviewed by back office clerks who would process the pin request and initiate a ground based mail that would send the participant his/her assigned pin number.

2. When the participant signs on for the first time, he/she is asked to change their pin number.

3. The participant can perform four primary functions on the Web. They are:

- View their account balance for checking and savings accounts. The system would automatically determine the user based on the login information and retrieve the information that needs to be displayed from a database. If the customer has more than one account then they are presented with a list and asked to select an account to view.
- View customer profile information such as name, address, age etc
- Transfer money between their savings to their checking accounts
- Create and view online a consolidated report of all their checking and savings accounts

The CEO of FIPB, Mr. Seymore Cash outlined the objectives of the new Web solution dubbed EasyMoney. The primary objectives of EasyMoney are to:

- Provide access to account information anytime, anywhere
- Provide current and accurate information to users, irrespective of the channel they use - for example, see a Teller, visit the Website, call the Call Center or access an ATM

- Provide a browser-based interface that can be customized and personalized to suit customers.
- Provide a common image or branding of the FIPB presence on all FIPB Web sites.

Mr. Cash, the CEO, was anxious to get this web presence up and functioning as soon as possible. The CIO of FIPB, Ms. Pro Crastinate identified that her department's skill sets consisted of solid mainframe development skills CICS/COBOL/VSAM. She also mentioned that she wanted to explore and move towards a Java-and EJB-based solution as the enterprise standard for Internet applications. The IT department also had a sprinkling of SUN and AIX servers and UNIX skills that were used to support other applications. You are being asked by the CIO to architect the solution and make recommendations on the best and quickest way to build and deploy the Website.

The security manager for FIPB, Warren Peace, was very concerned about allowing internet access to the customer account information. As an added precaution, he insists that there be three firewalls built into the system. The first being the standard Protocol Firewall, the second being the Domain Firewall and the Third being an additional Firewall in front of the Database servers. Thus any hacker would have to break through all three firewalls to get to a customer's account information. In addition, he is requiring that the system be highly available and have failover capabilities.

After several interviews with FIPB personal the initial consulting team were able to collect the following information.

EasyMoney will be made available to participants and plan sponsors across the Internet. It can also be accessed by Customer Service Representatives (CSRs) across FIPB's Intranet. EasyMoney will provide customers the ability to use a browser based interface to access and manage their savings and checking accounts as well as get consolidated reports. FIPB wants to create a Web site with a stable and scalable architecture and provide all of the business functions available from a teller or an ATM. The processes that will be supported by the application include:

- Manage profile
- View Accounts and account balances
- Transfer money between Checking and Savings Accounts
- View consolidated reports on Checking and Savings Accounts (statement on demand)

The intent is to, in the near future, make similar capability available to Tellers at the branch offices so that they get better user experience and access to additional functionality.

The requirement is to access applications running on AS/400 and S/390 to perform the above mentioned functions using the transactions used by CSRs today.

The details on the numbers are sketchy at best. FIPB has 5 million active accounts. There are 140 CSRs. 200 branch offices with an average 5 terminals in each one of them. FIPB is also planning to hire an outside company to handle additional call volumes. A conversation with the call center manager showed that the centers received about 8000 calls a day. A major part of these calls were inquiries for account balances. The CEO and other business leaders estimate that if the information was made available to the customers they would check their account balances an average of once a week and request consolidated reports about once a month. A quick conversation with the mainframe analyst Ms. Em VeEss showed that she felt each Web transaction would require anywhere from 2 to 4 calls or database reads. She also volunteered that the mainframe and AS/400 provided under one second response time for most inquiry transactions and the worst performing transaction took 3 seconds.

# Exercise 4. Building a Design using Collaborative and Information Aggregation Patterns

## What This Exercise is About

Working in teams, students will draw a set of design diagrams to show a solution to the problems stated in the case study scenario for ABC Insurance (below).

## What You Should Be Able to Do

At the end of the lab, you should be able to apply the patterns for e-business to a business scenario.

## Introduction

In this exercise you will read a business case scenario and identify which business and application pattern best fits in the business scenario.

Then you will create a set of design diagrams to describe a solution to the scenario. You must use the notation and templates as used in the Patterns for e-business book to document your solution.

After creating your design, your team will present the design to the rest of the class and discuss the factors that influenced design decisions.

Finally the class will evaluate the designs against the business and IT drivers identified in the case study.

## References and Resources

Book: *Patterns for e-business: A Strategy for Reuse.*

Redbook: *A Roadmap for Deploying Domino in the Organization,* SG24-5617-00

Redbook: *Applying the Patterns for e-business to Domino and WebSphere Scenarios*, SG24-6255-00

Redbook: *Domino and WebSphere Together Second Edition,* SG24-5955-01

Web Site: IBM Patterns for e-business
http://www-106.ibm.com/developerworks/patterns/
Offline version also available on CD.

# Exercise Instructions

## Deliverables:

Diagrams showing the system and components for the selected pattern.

1. Solution Overview diagram - This chart shows the general view of the various components, products and technologies organized in a clear and readable fashion. This diagram is expected to be an example of a run-time diagram. Examples can be found in the redbooks and in the book referenced above.
   - See unit 3.
   - See pages 21- 23 of the book.
2. Static application component diagram - This chart shows the software components for the application solution, located in their tiers and servers.
3. Dynamic flow diagram - This chart shows the specific software pieces needed to explain the flow of data and control through the system for one use case.
4. Business drivers - evaluation chart 1 - fitness for scenario - This chart shows a list of the Business drivers from the Book for the teams' selected pattern. Each driver is given a rating by the team from 1 to 5, where 5 is low. This rating is a measure of how well the pattern fits the needs of ABC Insurance.
5. IT drivers - evaluation chart 2 - fitness for scenario - This chart shows a list of the IT drivers from the Book for the team's selected pattern. Each driver is given a rating by the team from 1 to 5, where 5 is low. This rating is a measure of how well the pattern fits the needs of ABC Insurance.

Notes: diagrams may be prepared and presented multiple ways: For example, transparencies and pens are available. A large screen projector will allow the presentation of PowerPoint/Freelance/Visio from a students laptop (no software is loaded on the classroom machines to help this); Flip charts and stands/pens are provided. In any media, clarity, readability, and neatness are paramount. Watch the fonts!

## Agenda and Timeline:

This exercise has the following time line:

| | |
|---|---|
| Reading and Design | 120 minutes |
| Team Presentation of Design | 15 min/team |
| Team Evaluation of Design | 15 min/team |

Reading and Design:

In the 2 hours, teams must read and discover the drivers from the case study, select the best pattern, and create the deliverables. Since it will take about 25 minutes to physically draw the diagrams, control of the time is critical. Follow the PDR scheme.

## Pattern Category assignments:

- Teams will choose from either the collaboration or information aggregation categories of patterns.

## Additional constraints:

- Each design should include use of a Lotus Domino server as one element of the solution.
- Identify and address skill problems for this design. Skill problems are the mismatch between available and needed skills to create and deploy the chosen design, or the need for training that significantly affects costs and delivery time, or the mismatch between the current organization's tools and development methods and the design's needs.

# Case Study: ABC Insurance

ABC is an insurance provider, looking to provide electronic document submission capabilities to its independent agent community via the Internet. While ABC expects the initial volume of electronic transactions to be small as compared to its traditional business processes, they do believe that by offering this infrastructure to their agent community ahead of the competition will provide growth opportunities in the future. ABC considers this as a way to improve organizational efficiency by reducing the time required to process insurance applications as well as, a cost reducing strategy by electronically processing this information.

The solution will provide the following:

- A personalized user/agent experience.
- Electronic insurance application submission.
- Integration with legacy systems for insurance application processing.
- Access to insurance rating and underwriting information.
- Access to insurance application status.
- Electronic premium payment submission.

ABC is also interested in providing these business functions over several channels, including Web Browsers across the Internet and personal digital assistants (PDAs)

### High-Level Business Description for the Solution Under Consideration

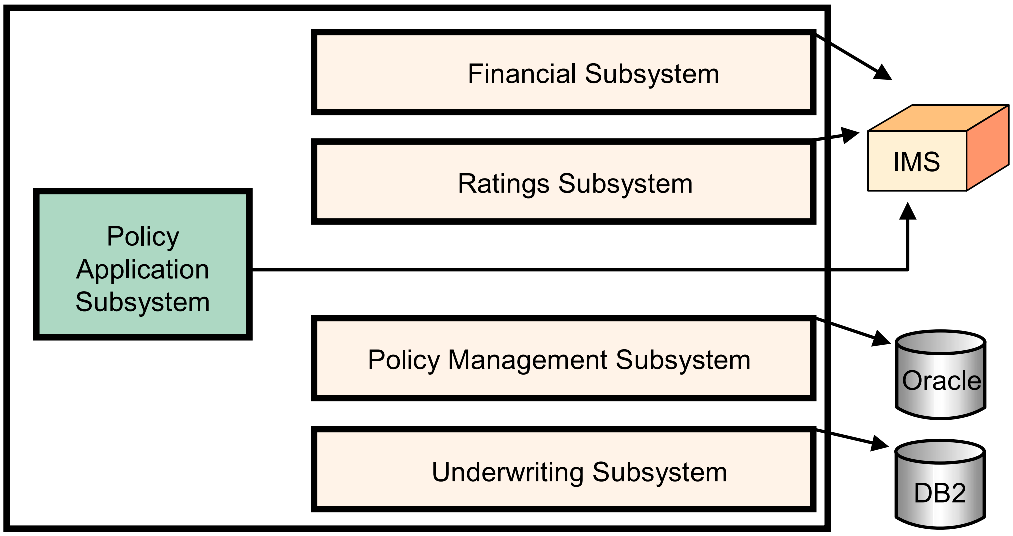
The ABC solution will provide a self service solution for our agents for online application submission. The solution must support a browser based user interface (UI) across the Internet. Our future plans are to expand this interface to wireless pervasive devices, such as PDAs. The solution should provide a personalized experience to the agent, at a minimum covering requirements such as a **secured logon**, and a **personal home page**.

For example, this page will be customized to a specific agent's requirements, such as pending applications and upcoming renewals.

The ABC solution will allow agents to **submit applications** for insurance coverage in an electronic document format. To accomplish this, the solution must interface with the **underwriting and rating legacy applications**. The solution should provide **work in progress** capabilities, indicating the status of a submitted application. An **alert feature** should be included as part of the work in progress feature, prompting the agent for updates or missing information in the application.

The solution should provide **electronic premium payments** for approved applications. Links to the ABC **financial applications** will be required to accommodate this feature. ABC uses **First Financial Bank** for processing the electronic payment.

# ABC Existing Systems



Financial Subsystem

Ratings Subsystem

Policy Application Subsystem

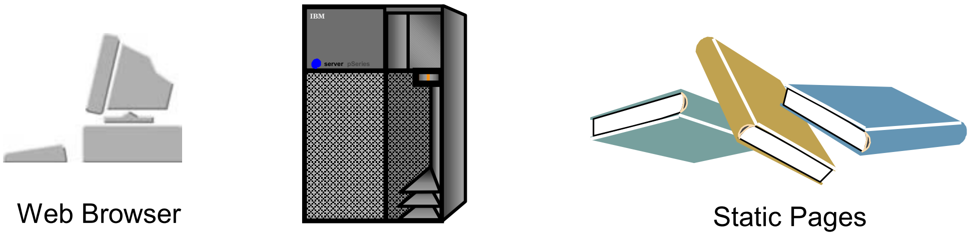
Policy Management Subsystem

Underwriting Subsystem

IMS

Oracle

DB2



Web Browser

Web Server

Static Pages

# Exercise 5. Creating a Design for Application Integration

## What This Exercise is About

Working in teams, students will draw a set of design diagrams to show a solution to the application integration problems stated in the case study scenario for Friendly Foods (below).

## What You Should Be Able to Do

At the end of the lab, you should be able to apply the patterns for e-business to a business scenario.

## Introduction

In this exercise you will read a business case scenario and identify which business and application pattern from the category assigned to your team best fits the business scenario.

Then you will create a set of design diagrams to describe a solution to the scenario. You must use the notation and templates as used in the Patterns for e-business book or unit 3 to document your solution.

After creating your design, your team will present the design to the rest of the class and discuss the factors that influenced design decisions.

Finally the class will evaluate the designs against the business and IT drivers identified in the case study.

## References and Resources

Book: *Patterns for e-business: A Strategy for Reuse.*

Redbook: *Business-to-Business Integration Using MQSeries and MQSI: Patterns for e-business Series*, SG24-6010-00

Redbook: *Business Process Management using MQSeries and Partner Agreement Manager*, SG24-6166-00

Web Site: IBM Patterns for e-business
http://www-106.ibm.com/developerworks/patterns/
Offline version also available on CD.

# Exercise Instructions

## Assignment:

Your goal is to design a solution that automates the reorder process between the Friendly Foods purchasing department and the company's various suppliers. Your solution should leverage the existing reorder process and handle the different format requirements imposed by the supplier's applications.

## Deliverables:

Diagrams showing the system and components for the specified pattern.

1. Solution Overview diagram - This chart shows the general view of the various components, products and technologies organized in a clear and readable fashion. This diagram is expected to be an example of a run-time diagram. Examples can be found in the redbooks and in the Book referenced above.
   - See unit 3.
   - See pages 21- 23 of the Book.
2. Static application component diagram - This chart shows the software components for the application solution, located in their tiers and servers.
3. Dynamic flow diagram - This chart shows the specific software pieces needed to explain the flow of data and control through the system for one use case.
4. Business drivers - evaluation chart 1 - fitness for scenario - This chart shows a list of the Business drivers from the Book for the teams' selected pattern. Each driver is given a rating by the team from 1 to 5, where 5 is low. This rating is a measure of how well the pattern fits the needs of Friendly Foods.
5. IT drivers - evaluation chart 2 - fitness for scenario. - This chart shows a list of the IT drivers from the Book for the team's selected pattern. Each driver is given a rating by the team from 1 to 5, where 5 is low. This rating is a measure of how well the pattern fits the needs of Friendly Foods.

**Notes:** Diagrams may be prepared and presented multiple ways: for example, transparencies and pens are available. A large screen projector will allow the presentation of PowerPoint/Freelance/Visio from a students laptop (no software is loaded on the classroom machines to help this); flip charts and stands/pens are provided. In any media, clarity, readability, and neatness are paramount. Watch the fonts!

## Agenda and Timeline:

This exercise has the following time line:

| | |
|---|---|
| Reading and Design | 90 minutes |
| Team Presentation of Design | 15 min/team |

| | |
|---|---|
| Team Evaluation of Design | 15 min/team |

Reading and Design: In the 90 minutes, teams must read and discover the drivers from the case study, apply the assigned pattern, and create the ratings lists. Since it will take about 25 minutes to physically draw the diagrams, control of the time is critical. Follow the PDR scheme.

### Pattern assignments:

- Teams will choose from:
  - Application Integration Patterns

## Case Study: Supplier Integration at Friendly Foods

The customer in this case is a bakery manufacturer, Friendly Foods. It manufactures various lines of bakery products. The raw materials for the bakery products were being received from a known set of suppliers, but, as the company has grown, there is a need for more suppliers. This is due to an increase in orders as well as to an increase in the variety of bakery products manufactured by the company.

The current materials reorder process is as follows:

1.The production department sends a request for materials to the purchasing department.

2.The purchasing department faxes a reorder to the supplier.

3.The supplier confirms that they received the order by sending a fax back to the purchasing department.

- The reorder process works if a supplier has already been established for a specific material using the Friendly Foods request for proposal (RFP) process. Otherwise, purchasing goes through a separate RFP process to establish a primary and a secondary supplier for the given material. For large orders, more than one supplier is established as a primary supplier based on the quantities it can provide. There are established policies and rules for such cases.
- Every once in a while, a supplier might not be able to fulfill an order due to exceptional circumstances or because it stopped carrying that material. In this case, the order is placed with a secondary supplier.
- Friendly Foods has recognized that its total cycle time for the reorder process (the time from when a reorder is placed, until it is fulfilled) is too long. This is often due to typing errors or to the quality of the fax documents.
- Friendly Foods wants to reduce the total cycle time for the reorder process between the purchasing department and the suppliers.
- The CIO at Friendly Foods has discussed this subject with its suppliers and has a consensus with the suppliers that they would work with him to explore what can be done to facilitate better business.

**Business drivers:**

- Reduce cycle time. High priority.
- Hold down costs. High priority.
  - Although there is a desire to automate the process, Friendly Foods is not willing to spend a lot of money to achieve this goal.
- Improve inventory management.
  - Because of a long turnaround time for ordering supplies, Friendly Foods is forced to stock extra raw materials. It would like to reduce the stock to free up space and capital.
- Make prudent IT investments.
  - Provide an enterprise architecture and infrastructure that scales to meet a broad range of business requirements.
  - Ensure that the level of manageability for new systems is equal to that of the existing systems.
  - Ensure that the formats for electronic messages required by the supplier systems are handled with minimal impact to the suppliers' IT systems.
  - The suppliers have different applications running on different platforms.

**Functional Requirements:**

- Automate Raw Materials reorder process between Purchasing and Suppliers
  - Use the existing reorder rules (currently on paper) which define the individual suppliers to be used as a first and second preference for a specific product

**Non functional requirements:**

- Security requirement: user authentication - high
- Operational requirement: Assured communications - medium
- Performance requirement: medium
- Scalability: Number of suppliers may grow
- Availability: 98% of the time - medium
- Extendibility: Should be possible to add more suppliers to the process with least work
- Flexibility: Should be able to handle various supplier format requirements
- Maintainability: required

To address some of the business drivers above, the customer has already defined the following requirements for a supplier integration solution:

- The CIO recently attended a conference and heard about Supply Chain Management automation. However, the CIO is not convinced that he should tackle the whole business process automation issue. He wants to try to automate only the reorder process between the purchasing department and the suppliers for now. He has decided to consider other issues, such as automating the RFP process and improving workflow between different departments, in the future.
- There is a need to build a new Web browser-based application that can be used by the purchasing department to enter reorder information. This information can be sent electronically to the qualified set of suppliers. The list of qualified suppliers for a specific reorder is decided based on the specific raw material required, the quantity required, and the date it is required. These rules for classifying the suppliers are well defined on paper.
- When a reorder is processed, it is recorded in the Friendly Foods Business System application before it is faxed to the supplier. A confirmation from the supplier is also entered in the same system.
- There is a concern that the suppliers' systems and applications might be running on multiple platforms and might be unable to handle electronic messages in any given format. The suppliers want to receive the electronic messages in a format that is understood by their applications. Therefore, there is a need to convert the format of the messages that are sent to different suppliers. The suppliers have agreed to use MQSeries as a communications mechanism. There is also a need to convert the format of the incoming messages.

There is a need to develop a procedure to inform the appropriate people when a supplier does not exist for a given material or when a supplier is not able to fulfill an order due to any number of reasons.

# Exercise 6. Creating a Design for Security and Performance

## What This Exercise is About

Working in teams, students will draw a set of design diagrams to show a solution to the problems stated in the case study scenario for FIPB (below).

## What You Should Be Able to Do

At the end of the lab, you should be able to identify security and performance related design issues for a business scenario and use them in designs.

## Introduction

In this exercise you will read a business case scenario and identify the security and performance issues which apply to the scenario and where the products assigned to your team can be used in the solution.

Then you will create a set a design diagrams to communicate the solution to these security and performance issues using the templates provided.

After creating your design, your team will present the design to the rest of the class and discuss the factors that influenced design decisions.

## References and Resources

Book: *Patterns for e-business: A Strategy for Reuse.*

White Paper: *Designing e-business Solutions for Performance*

Redbook: Enterprise Security Architecture using IBM Tivoli Security Solutions SG24-6014-00

Redbook: *WebSphere Edge Server New Features and Functions in Version 2*, SG24-6511-00

Redbook: *IBM WebSphere V4.0 Advanced Edition Security*, SG24-6520-00 or *IBM WebSphere V5.0 Security*, SG24-6573-00

Redbook: *Enterprise Business Portals with IBM Tivoli Access Manager*, SG24-6556-00

Redbook: *Patterns for the Edge of Network*, SG24-6822-00

Web Site: IBM Patterns for e-business
http://www-106.ibm.com/developerworks/patterns/
Offline version also available on CD.

# Exercise Instructions

## Assignment:

Identify the security and performance issues which apply to the First InterPlanetary Bank scenario and where the products assigned to your team can be used in the solution. Diagram the solution to the product mappings level and document the security and performance characteristics of the application using the templates provided.

## Deliverables:

Diagrams showing the system and components for the chosen pattern.

1. Solution Overview diagram - This chart shows the general view of the various components, products and technologies organized in a clear and readable fashion. This diagram is expected to be an example of a "run-time diagram". Examples can be found in the redbooks and in the Book referenced above.
    - See pages 21- 23 of the Book.
2. Static application component diagram - This chart shows the software components for the application solution, located in their tiers and servers.
    - Identify performance related features such as caches, and decision points for workload management.
3. Dynamic flow diagram - This chart shows the specific software pieces needed to explain the flow of data and control through the system for one use case transfer money.
    - Identify security flows such as authentication and authorization flows and the security protocols used.
4. List of criteria that led you to choose the particular design.

**Notes:** Diagrams may be prepared and presented multiple ways: for example, transparencies and pens are available. A large screen projector will allow the presentation of PowerPoint/Freelance/Visio from a students laptop (no software is loaded on the classroom machines to help this); flip charts and stands/pens are provided. In any media, clarity, readability, and neatness are paramount. Watch the fonts!

## Agenda and Timeline:

This exercise has the following time line:

| | |
|---|---|
| Reading and Design | 90 minutes |
| Team Presentation of Design | 10 min/team |
| Team Evaluation of Design | 10 min/team |

Reading and Design:  In the 90 minutes, teams must read and discover the security and performance issues from the case study, apply the assigned product, create diagrams and create the ratings lists. Since it will take about 30 minutes to physically draw the diagrams and create the lists, control of the time is critical. Follow the PDR scheme.

### Product assignments:

- Team 1: Tivoli Access Manager with WebSphere
- Team 2: Edge Server with WebSphere
- Team 3: Combined TAM and Edge Server with WebSphere
- Note: If a Team 4 was created for the earlier exercises, this team should be broken up (or all teams should be broken up) and three teams should be formed for this exercise.

The following application patterns have been selected as the basis of the solution:

- Self-Service::Router application pattern
- Access Integration::Single Sign-On application pattern

Use the appropriate run-time patterns and product mappings associated with these application patterns to help you to develop the Solution Overview Diagram and other deliverables for your design.

## Case Study: First Inter-Planetary Bank

The First Inter-Planetary Bank (FIPB) provides Banking and Financial Services for its customers. Their services include Terrestrial Checking, and Savings Accounts and Inter-Planetary Bank transfers. Currently their checking account information is stored on an IBM 390 Mainframe and their savings account information is stored on an AS400 system. These legacy systems are in different locations. Access to these systems is currently done by tellers with dedicated terminals or by call center representatives (CSRs) using terminals with "Green Screen" client applications. Customers can also make deposits, withdrawals, check balances and get account summary reports using ATM machines.

FIPB finds that its customers are increasingly demanding and expecting on-line banking services. FIPB is facing intense competition from its bigger rivals such as Universal Banking, which offers a full range of online banking services. The business managers at FIPB decided that they had to act quickly to keep from losing their share of the Inter-Planetary banking market. They needed to offer their customers an on-line service that would perform the following tasks online:

1. Request a pin across the Web. The pin request would be captured in a Database that would be reviewed by back office clerks who would process the pin request and initiate a ground based mail that would send the participant his/her assigned pin number.

2. When the participant signs on for the first time, he/she is asked to change their pin number.

3. The participant can perform four primary functions on the Web. They are:

- View their account balance for checking and savings accounts. The system would automatically determine the user based on the login information and retrieve the information that needs to be displayed from a database. If the customer has more than one account then they are presented with a list and asked to select an account to view.
- View customer profile information such as name, address, age etc
- Transfer money between their savings to their checking accounts
- Create and view online a consolidated report of all their checking and savings accounts

The CEO of FIPB, Mr. Seymore Cash outlined the objectives of the new Web solution dubbed 'EasyMoney'. The primary objectives of EasyMoney are to:

- Provide access to account information anytime, anywhere
- Provide current and accurate information to users, irrespective of the channel they use - for example, See a Teller, visit the Web site, call the Call Center or access an ATM
- Provide a browser-based interface that can be customized and personalized to suit customers.
- Provide a common image or branding of the FIPB presence on all FIPB Websites.

Mr. Cash, the CEO, was anxious to get this web presence up and functioning as soon as possible. The CIO of FIPB, Ms. Pro Crastinate identified that her department's skill sets consisted of solid mainframe development skills CICS/COBOL/VSAM. She also mentioned that she wanted to explore and move towards a Java-and EJB-based solution as the enterprise standard for Internet applications. The IT department also had a sprinkling of SUN and AIX servers and UNIX skills that were used to support other applications. You are being asked by the CIO to architect the solution and make recommendations on the best and quickest way to build and deploy the Web site.

The security manager for FIPB, Warren Peace, was very concerned about allowing internet access to the customer account information. As an added precaution, he insists that there be three firewalls built into the system. The first being the standard Protocol Firewall, the second being the Domain Firewall and the Third being an additional Firewall in front of the Database servers. Thus any hacker would have to break through all three firewalls to get to a customer's account information. In addition, he is requiring that the system be highly available and have failover capabilities.

After several interviews with FIPB personal the initial consulting team were able to collect the following information.

EasyMoney will be made available to participants and plan sponsors across the Internet. It can also be accessed by Customer Service Representatives (CSRs) across FIPB's Intranet. EasyMoney will provide customers the ability to use a browser based interface to access and manage their savings and checking accounts as well as get consolidated reports. FIPB wants to create a Web site with a stable and scalable architecture and provide all of the business functions available from a teller or an ATM. The processes that will be supported by the application include:

- Manage profile
- View Accounts and account balances
- Transfer money between Checking and Savings Accounts
- View consolidated reports on Checking and Savings Accounts (statement on demand)

The intent is to, in the near future, make similar capability available to Tellers at the branch offices so that they get better user experience and access to additional functionality.

The requirement is to access applications running on AS/400 and S/390 to perform the above mentioned functions using the transactions used by CSRs today.

The details on the numbers are sketchy at best. FIPB has 5 million active accounts. There are 140 CSRs. 200 branch offices with an average 5 terminals in each one of them. FIPB is also planning to hire an outside company to handle additional call volumes. A conversation with the call center manager showed that the centers received about 8000 calls a day. A major part of these calls were inquiries for account balances. The CEO and other business leaders estimate that if the information was made available to the customers they would check their account balances an average of once a week and request consolidated reports about once a month. A quick conversation with the mainframe analyst Ms. Em VeEss showed that she felt each web transaction would require anywhere from 2 to 4 calls or database reads. She also volunteered that the mainframe and AS/400 provided under one second response time for most inquiry transactions and the worst performing transaction took 3 seconds.